



**Arizona
Department of
Education**

Mathematics Standards Chart for AIMS

Standards 1 through 6

**Essentials Level (Grade 5)
Reflecting the Blueprint of 08.26.96**

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 1: NUMBER SENSE

STANDARD 1: NUMBER SENSE Students develop number sense and use numbers and number relationships to acquire basic facts, to solve a wide variety of real-world problems, and to determine the reasonableness of results. <i>Students know and are able to do all the Readiness and Foundations PO's, and the following</i>	Number of Questions	
	7 - 9	1
CONCEPT/Performance Objective	MC	SA
1M-E1. Read, write and order integers, whole numbers and rational numbers	1 - 2	0
PO 1. Compare and order using concrete or illustrated models A. whole numbers (to millions) B. common fractions (halves, thirds, fourths, eighths) C. decimals (thousandths)		
PO 2. Represent place value using concrete or illustrated models A. whole numbers (millions), decimals (thousandths)		
PO 3. Read and write whole numbers, integers, common fractions and decimals using real-world situations A. whole number (millions), decimals (thousandths), fractions (halves, thirds, fourths, eighths)		
1M-E2. Relate the basic arithmetic operations to one another (e.g., multiplication and division are inverse operations)	1 - 2	1
PO 1. Represent the process of multiplication as repeated addition using concrete or illustrative models A. whole numbers		
PO 2. Represent the process of division as repeated subtraction, partitioning a group and partitioning a whole using concrete or illustrative models A. whole numbers		
PO 3. Write the family of equations using inverse operations for a given set of numbers A. whole numbers with addition/subtraction ($4 + 5 = 9$, $5 + 4 = 9$, $9 - 4 = 5$, $9 - 5 = 4$) and multiplication/division		
1M-E3. Demonstrate proficiency with the operations of multiplication and division of whole numbers	2 - 3	0
PO 1. Calculate multiplication/division A. three-digit by two-digit to find the product B. facts through 12 C. mental math and estimation with multiples of 10 D. one-digit divisor to find quotient with remainder		
PO 2. Calculate multiplication and division problems using contextual situations		

Note: The numbering and lettering scheme is discontinuous because the Arizona Academic Standards use the same scheme to include both grade 5 and grade 8, and the present document represents only the objectives tested at grade 5 and the concepts that include them.

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 1, continued		
CONCEPT/Performance Objective	MC	SA
1M-E4. Develop and apply number theory concepts (e.g., primes, factors and multiples) to represent numbers in various ways	1 - 2	0
PO 1. State the factors for a given whole number		
PO 4. Sort numbers by their properties: A. odd, even		
1M-E5. Represent and use numbers in equivalent forms (integers, fractions, percent, decimals, exponents, scientific notation and square roots)	2 - 4	0
PO 2. Demonstrate the relationship and equivalency among A. decimals, fractions, and percents (e.g., $\frac{1}{2} = .5 = 50\%$ with halves, fourths and tenths)		
1M-E6. Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measurements	0	0
PO 2. Apply the appropriate strategy (e.g., estimation, approximation, rounding or exact numbers) when calculating to solve problems		
PO 3. Demonstrate/describe the magnitude of A. whole numbers (e.g., "How many apples in the orchard?")		
NOTE: <i>The following is to be assessed at the district level.)</i>		
PO 4. Interpret calculations and calculator results within a contextual situation		

STANDARD 2: DATA ANALYSIS AND PROBABILITY

STANDARD 2: DATA ANALYSIS AND PROBABILITY		Number of Questions	
Students use data collection and analysis, statistics, and probability to make valid inferences, decisions and arguments and to solve a variety of real-world problems.			
<i>Students know and are able to do all the Readiness and Foundations PO's, and the following</i>		5 - 7	1
CONCEPT/Performance Objective	MC	SA	
2M-E1. Construct, read, analyze and interpret tables, charts, graphs and data plots (e.g., box and whisker, stem and leaf, and scatter plots)	2 - 3	1	
PO 1. Construct: A. bar graphs, line graphs, frequency tables and Venn diagrams			
PO 2. Interpret and analyze data from graphical representations and draw simple conclusions: A. bar graphs, line graphs, circle graphs, frequency tables and Venn diagrams			
2M-E2. Make valid inferences, predictions and arguments based on statistical analysis	1 - 2	0	
PO 1. Formulate predictions from a given set of data and justify predictions			
PO 2. Compare a given prediction with the results of an investigation			

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 2, continued		
CONCEPT/Performance Objective	MC	SA
2M-E3. Display and use measures of range and central tendency (i.e., mean, median and mode)	0	0
PO 1. Find the mean, median, mode and range of data using concrete and illustrative models		
2M-E4. Use counting strategies to determine all the possible outcomes of a particular event (e.g., the number of ways students can line up to have their picture taken)	0	0
PO 1. Find all possible outcome sets involving A. two sets of objects (e.g., shirts and pants)		
2M-E5. Determine probabilities through experiments and/or simulations and compare the results with the mathematical expectation	1 - 2	0
PO 1. Make predictions from the results of a student-generated experiment (empirical probability) A. single events (e.g., spinners)		
PO 3. Describe events that are certain or impossible		
PO 5. Identify outcomes that are more likely, less likely or equally likely to occur		

STANDARD 3: PATTERNS, ALGEBRA AND FUNCTIONS

STANDARD 3: PATTERNS, ALGEBRA AND FUNCTIONS		Number of Questions	
Students use algebraic methods to explore, model and describe patterns, relationships and functions involving numbers, shapes, data and graphs within a variety of real-world problem-solving situations. <i>Students know and are able to do all the Readiness and Foundations PO's, and the following</i>		6 - 8	0
CONCEPT/Performance Objective	MC	SA	
3M-E1. Use algebraic methods (write number sentences, in the form of expressions and equations) to explore, model and describe patterns and functions involving numbers, shapes, data, graphs and data plots	2 - 3	0	
PO 1. Extend simple geometric and number patterns (e.g., 1, 1, 2, 1, 1, 3, 1, 1, 4,...)			
PO 2. Create simple geometric and number patterns			
PO 3. Describe a rule for a simple pattern (e.g., 5, 10, 15, 20,...rule = add five or count by five's)			
3M-E2. Describe, represent and analyze patterns and relationships using shapes, tables, graphs, data plots, verbal rules and standard algebraic notation	0	0	
This is covered in 3ME1-PO1, PO2, PO3, PO4; and 3ME4-PO1, PO2, PO3, PO4			

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 3, continued		
CONCEPT/Performance Objective	MC	SA
3M-E4. Analyze functional relationships to explain how a change in one variable results in a change in another	2 - 3	0
PO 1. Describe a real-life situation in which a change in one variable results in the change of the other (e.g., temperature in the classroom goes up and the amount of clothing goes down)		
PO 3. Compute an “output” for a given “input” in a function		
3M-E7. Solve simple linear equations and inequalities using a variety of methods (e.g., informal, formal, graphical) and a variety of manipulatives	2 - 4	0
PO 1. Solve equations using A. whole numbers with one variable-one step		
PO 3. Graph given data points to represent a linear equation A. on a coordinate grid with whole numbers		

STANDARD 4: GEOMETRY

STANDARD 4: GEOMETRY Students use geometric methods, properties and relationships as a means to recognize, draw, describe, connect, and analyze shapes and representations in the physical world. <i>Students know and are able to do all the Readiness and Foundations PO's, and the following</i>	Number of Questions	
	5 - 7	1
CONCEPT/Performance Objective	MC	SA
4M-E1. Visualize and draw two- and three-dimensional geometric figures with special attention to analyzing and reasoning informally about their properties (e.g., parallelism, perpendicularity and congruence)	1 - 2	0
PO 1. Classify two-dimensional shapes and three-dimensional figures by their properties A. by sight		
PO 2. Identify the properties of geometric figures using appropriate terminology and vocabulary (e.g., parallelism, perpendicularity and congruency) A. two-dimensional shapes (three- and four-sided polygons)		
PO 3. Draw or build two-dimensional shapes...by applying significant properties of each (e.g., draw a rectangle with two sets of parallel sides and four right angles)		
4M-E2. Apply geometric properties and relationships such as congruence, similarity, angle measure, parallelism and perpendicularity to real-world situations	2 - 4	0
PO 1. Design or draw a model (e.g., designing a playhouse, garden) that demonstrates basic geometric relationships, such as A. parallelism, perpendicularity, similarity		
PO 2. Classify triangles by their angles and sides (e.g., equilateral, acute, isosceles...)		
PO 3. Identify lines that are parallel and perpendicular		
PO 4. Distinguish shapes that are congruent		

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 4, continued		
CONCEPT/Performance Objective	MC	SA
4M-E3. Perform elementary transformations (e.g., tessellations, flips, slides, rotations)	0 - 1	1
PO 1. Demonstrate slide, flip or turn using concrete geometric figures		
PO 2. Illustrate, using concrete or pictorial models, A. slide, flip or turn (e.g., quilts)		
PO 3. Draw or build a shape that A. has symmetry		
4M-E4. Represent and solve problems relating to size, shape, area and volume using geometric models	1 - 3	0
PO 1. Solve problems using given formulas for A. simple area and perimeter		
PO 2. Identify a variety of shapes having the same perimeter and area		
4M-E4. Represent and solve problems relating to size, shape, area and volume using geometric models	1 - 3	0
PO 1. Solve problems using given formulas for A. simple area and perimeter		
PO 2. Identify a variety of shapes having the same perimeter and area		

STANDARD 5: MEASUREMENT AND DISCRETE MATHEMATICS

STANDARD 5: MEASUREMENT AND DISCRETE MATHEMATICS		Number of Questions	
<p>Students make and use direct and indirect measurement, metric and U.S. customary, to describe and compare the real world and to prepare for the study of discrete functions, fractals and chaos which have evolved out of the age of technology.</p> <p><i>Students know and are able to do all the Readiness and Foundations PO's, and the following</i></p>			
		4 - 6	1
CONCEPT/Performance Objective	MC	SA	
5M-E1. Estimate, make and use measurements (U.S. customary and metric) to describe and make comparisons	1 - 2	0	
PO 1. Measure length, volume and weight in both U.S. customary and metric units			
PO 2. Convert measurement units to equivalent units within a given system (customary and metric) (e.g., 12 inches = 1 foot, 10 decimeters = 1 meter)			
PO 3. Estimate measurements for both U.S. customary and metric units within either system			

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 5, continued		
CONCEPT/Performance Objective	MC	SA
5M-E2. Select and use appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation	1 - 3	0
PO 1. State the appropriate tool to measure in a particular situation (e.g., "What tool would you use to measure the top of your desk?")		
PO 2. State the appropriate unit of measurement in a particular situation (e.g., "What unit of measurement would you use to measure the top of your desk?")		
PO 3. Measure to the appropriate degree of accuracy to solve problems (e.g., measuring to the nearest $\frac{1}{16}$ -inch or nearest $\frac{1}{2}$ -inch; measuring to the nearest ounce or nearest pound; measuring to the nearest millimeter or nearest liter)		
5M-E3. Estimate, use and describe measures of distance, perimeter, area, volume, capacity, weight, mass and angles	1 - 3	0
PO 1. Differentiate between perimeter and area quadrilaterals using concrete and illustrative models		
PO 2. Record estimates and measurements for A. distance		
5M-E4. Develop and use formulas and procedures to solve problems involving measurement	0	1
PO 1. Develop a procedure or formula to calculate A. area and perimeter of simple polygons		
PO 2. Use given formulas to find A. area and perimeter of simple polygons		
5M-E5. Describe how a change in the linear dimension of an object affects its perimeter, area and volume	0	0
PO 1. Describe the change in perimeter and area when one dimension of an object is altered		

MATHEMATICS STANDARDS CHART FOR AIMS - ESSENTIALS LEVEL (5TH GRADE)

STANDARD 6: MATHEMATICAL STRUCTURE/LOGIC

STANDARD 6: MATHEMATICAL STRUCTURE/LOGIC Students use both inductive and deductive reasoning as they make conjectures and test the validity of arguments <i>Students know and are able to do all the Readiness and Foundations PO's, and the following</i>	Number of Questions	
	3 - 4	1
CONCEPT/Performance Objective	MC	SA
6M-E1. (No performance objectives at the 5th grade level.)	0	0
6M-E2. Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers	0 - 1	1
PO 1. Design a method with a series of defined steps for solving a problem; justify the method A. whole numbers		
6M-E3. Use <i>if...then</i> statements to construct simple valid arguments	3 - 4	0
PO 1. Construct simple valid arguments using if...then statements based on A. graphic organizers (e.g., Venn diagrams and pictures...) B. geometric shapes		

TOTAL NUMBER OF AIMS ESSENTIALS (GRADE 5) MATHEMATICS QUESTIONS	34 - 37	5
	MC	SA
TOTAL NUMBER OF AIMS ESSENTIALS (GRADE 5) MATHEMATICS POINTS	34 - 37	10

NOTE: Mathematics assesses points by concept, not by performance objective.

*All concepts with a number greater than 0 in the "Number of Questions" column will be assessed on every AIMS test form. However, the number of points per concept and the total number of total points possible will vary slightly from form to form.